

# Treatment of vulvovaginal candidal infection with miconazole-coated tampons

N A M BERGSTEIN

*From the Department of Obstetrics and Gynaecology, Regional Hospital, Zevenaar, the Netherlands*

**SUMMARY** In an evaluation of three different treatment regimens miconazole-coated tampons proved to be effective for the relief of vulvovaginal candidal infection. A mycological and clinical cure rate of about 93% was achieved in patients treated with one tampon twice daily (up to a total of 15 tampons); 61% of patients were mycologically cured with a regimen of one tampon daily for only five days. Reinfection rates were less than 4% with all three regimens. The tampons were well accepted by all the patients.

## Introduction

Although there is a variety of antifungal compounds available for the treatment of candidal vulvovaginitis<sup>1</sup> it is clear that the clinical efficacy of such agents may be offset in many patients who fail to complete a full course of treatment.<sup>2</sup> For many years most vaginal antifungal agents have been routinely prescribed for 14 days or more, but such long courses of treatment may be abandoned prematurely by patients who experience rapid symptomatic relief of their vaginitis<sup>2</sup> or by those who object to the usual creams, ointments, pessaries, or tablets because of difficulty of application or leakage or for other aesthetic reasons.<sup>3-5</sup>

One compound, miconazole, has now been made available in the form of a coating on absorbent vaginal tampons. This presentation should be more aesthetically acceptable to patients than vaginal creams or pessaries; however the clinical efficacy of miconazole-coated tampons requires evaluation.

This paper presents the clinical and mycological findings of a study of miconazole-coated tampons in the treatment of patients with candidal vaginitis and compares the relative efficacies of three different regimens.

## Patients and methods

### STUDY POPULATION

The patients admitted to the study were all premenopausal patients attending the obstetric and

gynaecological outpatient clinic with features of vaginal candidosis—such as discharge, pruritus, dysuria, and dyspareunia—which was confirmed twice by the presence of *Candida* species on phase contrast microscopy and on culture of vaginal swabs on Nickerson's medium (Ortho Pharmaceutica Co, Belgium). (The latter is a selective medium on which members of the genus *Candida* grow as dark-brown or black colonies.) Trichomonads were excluded by negative results on phase contrast microscopy of vaginal swabs.

### TREATMENT REGIMENS

#### Group A

All patients visiting the outpatient clinic between October 1976 and February 1977 were treated with a total of 15 medicated tampons coated with miconazole 100 mg in an inert base (Janssen Pharmaceutica, Belgium), one inserted into the vagina twice daily, up to a total of 15 tampons.

#### Group B

All patients attending between July and August 1977 were treated with 10 miconazole tampons, one inserted into the vagina twice daily for five days.

#### Group C

All patients attending between September and November 1977 were treated with a total of only five tampons, one inserted daily for five days.

The number of patients in each group, their ages, and clinical factors that may have predisposed to candidal infection are summarised in table 1. Although the groups were well matched for age, there was only one pregnant patient in group C and only 3% of patients in group B were fitted with an intrauterine contraceptive device compared with 13%

Address for reprints: Dr N A M Bergstein, Department of Obstetrics and Gynaecology, Outpatient Clinic, Streektziekenhuis, Zevenaar, the Netherlands

Received for publication 12 February 1979

TABLE I Clinical histories of patients treated with miconazole-coated tampons

Clinical details	Treatment regimen		
	Group A*	Group B†	Group C‡
No of patients	83	58	90
Median age (years)	30	30	30
Age range (years)	17-48	18-55	19-48
No pregnant	10	8	1
No using oral contraceptives	28	27	53
No with intrauterine contraceptive device	11	2	12
No previously treated with anticondical therapy	7	4	0
No previously treated with trichomonacides	0	0	1

\*Treated twice daily for 7½ days

†Treated twice daily for five days

‡Treated daily for five days

in groups A and C; this latter difference was not statistically significant.

No patients had recently used antibiotics and none had diabetes mellitus. No medications were prescribed for any of the patients apart from the miconazole-coated tampons.

#### FOLLOW-UP

Follow-up examinations were performed on patients in all three groups 3-7 days after the end of treatment; for patients who were mycologically cured at this time a second follow-up examination was carried out one month after the end of treatment to determine rates of recurrence of candidosis.

On admission to the study and at subsequent follow-up examinations the patients were assessed clinically for severity of the following signs and symptoms; vaginal discharge, vulval pruritus, dysuria, dyspareunia, and vulval erythema. These features were rated as: "absent," "mild," or "more or less severe." A vaginal swab was also taken at each examination for culture of *Candida* species.

#### STATISTICS

Statistical evaluation of the differences in mycological cure rates between groups A, B, and C

was performed using the  $\chi^2$  test ( $2 \times 2$  contingency table, two-tailed) with Yates's correction.

#### Results

##### CURE RATES

About 93% of patients in groups A and B had become culture-negative for *Candida* 3-7 days after treatment with miconazole-coated tampons (table II); however the mycological cure rate for patients in group C was only 61%. The differences in mycological cure rates between groups A and C ( $\chi^2 = 22.216$ ,  $P < 0.0001$ ) and between groups B and C ( $\chi^2 = 16.9886$ ,  $P < 0.0001$ ) were statistically significant. In all three groups patients who became *Candida*-negative remained so; mycological recurrence rates were less than 4% for all three groups (table II).

##### RELIEF OF SYMPTOMS

The high mycological cure rates in groups A and B were reflected by high rates of relief from symptoms of candidosis (table III). On admission almost all the patients in these groups had "more or less" severe discharge and pruritus, but the frequency of these symptoms was reduced to less than 9% 3-7 days after treatment, with only low rates of recurrence or persistence of symptoms among mycologically cured patients assessed one month after treatment. Among patients in group C the reduction in frequency of vaginal discharge was less impressive than for groups A and B, although the relief of pruritus was similar to that for groups A and B. The other symptoms and signs of vaginal candidosis were noted less often than pruritus and discharge at the time of admission to the study; they were relieved successfully for all but a few patients with all three treatment regimens.

##### SUBJECTIVE ASSESSMENT

The miconazole-coated tampons were well accepted by all the patients. More than 80% of patients in group A and 69% of patients in group B subjectively described the results of their treatment as excellent,

TABLE II Mycological findings in three groups of patients treated for vaginal candidosis with miconazole-coated tampons

Time of sample	Group A			Group B			Group C		
	No of cases	No with negative cultures	% of total	No of cases	No with negative cultures	% of total	No of cases	No with negative cultures	% of total
Before treatment	83	0	0.0	58	0	0.0	90	0	0.0
3-7 days after treatment*	83	77	92.8	58	54	93.1	90	55	61.1
1 month after treatment†‡	77	75	97.4	53§	52	98.1	55	53	96.4

\*A vs B = not significant; A vs C =  $\chi^2$  22.216,  $P < 0.0001$ ; B vs C =  $\chi^2$  16.9886,  $P < 0.0001$ 

†A vs B = not significant; A vs C = not significant, B vs C = not significant

‡Patients examined one month after treatment were only those who were mycologically negative 3-7 days after treatment

§One patient did not attend for the second follow-up visit

TABLE III *Relief of signs and symptoms of vaginal candidosis in three groups of patients treated with miconazole-coated tampons*

Sign or symptom	Time of examination (in relation to treatment)	Group A		Group B		Group C	
		No of cases	% with score 2*	No of cases	% with score 2*	No of cases	% with score 2*
Vaginal discharge†	Before	83	98.8	58	100.0	90	83.3
	3-7 days after	83	8.4	58	3.4	90	13.3
	1 month after	77	5.2	53	0.0	55	0.0
Vaginal discharge‡	Before	83	100.0	58	100.0	90	80.0
	3-7 days after	83	8.4	58	1.7	90	13.3
	1 month after	77	5.2	53	0.0	55	0.0
Vulval pruritus	Before	83	97.6	58	84.5	90	44.4
	3-7 days after	83	6.0	58	3.4	90	2.2
	1 month after	77	5.2	53	0.0	55	1.8
Dysuria	Before	83	81.9	58	72.4	90	16.7
	3-7 days after	83	6.0	58	3.4	90	0.0
	1 month after	77	3.9	53	0.0	55	0.0
Dyspareunia	Before	83	31.3	58	24.1	90	11.1
	3-7 days after	83	1.2	58	1.7	90	0.0
	1 month after	77	1.3	53	0.0	55	0.0
Vulval erythema	Before	83	1.2	58	0.0	90	0.0
	3-7 days after	83	0.0	58	0.0	90	0.0
	1 month after	77	0.0	53	0.0	55	0.0

\*Severity scores: 0 = absent, 1 = slight, 2 = more or less severe

†Patient's own assessment

‡Investigator's assessment

and their opinions were matched by the overall assessments of the investigator (table IV). In group C only half the patients considered the treatment as excellent. The patients noted complete disappearance of their symptoms five days after the beginning of treatment in 61%, 79%, and 27% of cases in groups A, B, and C respectively.

## Discussion

The results of this study demonstrate that miconazole-coated tampons are effective in the relief of vulvovaginal candidal infection provided they are used twice daily for at least five days. The high clinical and mycological cure rates achieved with this regimen compare favourably with published cure rates for miconazole creams and pessaries used for longer periods<sup>1, 6</sup> and with the results of the first interim analysis of a multicentre evaluation of the miconazole-coated tampon in Britain.<sup>7</sup> Furthermore

the tampons are a highly acceptable mode of presentation for vaginal antifungal compounds; they could be used easily and continue to be used during menstruation.

The comparatively poor therapeutic success of the use of one tampon daily for five days was a notable feature of this trial. From a retrospective analysis of data from large numbers of published trials of vaginal antifungal agents, it appeared that a 14-day course of treatment was the minimum period needed to ensure high cure rates with low recurrence of candidosis. The present study, together with trials of short courses of imidazole-derivative antifungal agents,<sup>8-10</sup> shows that three-day or five-day courses may be as effective as 14-day courses in many cases. Comparison of the data for groups B and C of the present study however suggests that it may be the total dose rather than the time during which the dose is given which is the important factor.

Future studies should be designed to investigate the relationship between the total antifungal dose, duration of therapy, and therapeutic success in order to establish optimal conditions for the topical treatment of vaginal candidosis.

TABLE IV *Subjective overall assessment of treatment of vaginal candidosis with miconazole-coated tampons*

Effect of therapy	Patient's assessment			Investigator's assessment		
	Group A	Group B	Group C	Group A	Group B	Group C
Excellent	70	40	48	69	40	47
Good	3	8	21	5	5	20
Doubtful	6	7	18	5	10	20
Failure	3	0	0	3	0	0
No opinion	1	3	3	1	3	3

## References

1. Odds FS. Cure and relapse with antifungal therapy. *Proc Roy Soc Med* 1977;70, suppl 4:24-8.
2. Masterton G, Henderson J, Napier I, Moffett M. Vaginal candidosis. *Br Med J* 1976;i:712-3.
3. Henderson JN, Tait IB. The use of povidone-iodine (Betadine) pessaries in the treatment of candidal and trichomonal vaginitis. *Curr Med Res Op* 1975;3:157-62.

4. Highton BK. A trial of clotrimazole and nystatin in vaginal moniliasis. *Journal of Obstetrics and Gynaecology of the British Commonwealth* 1973; **80**:992-5.
5. Weuta H. Clotrimazol-vaginaltabletten—klinische Prüfung im offenen versuch. *Arzneim Forsch* 1972; **22**:1291-4.
6. Sawyer PR, Brogden RN, Pinder RM, Speight TM, Avery GS. Miconazole: a review of its antifungal activity and therapeutic efficacy. *Drugs* 1975; **9**:406-23.
7. Donald WH. A study on the cure and relapse of candidal vaginitis with a novel formulation of miconazole. In: *Candidal Vaginitis*. London: Academic Press Inc and the Royal Society of Medicine. *International Congress and Symposium Series* 1979; **7**:31-3.
8. Balmer JA. Three-day therapy of vulvovaginal candidiasis with econazole: a multicentre study comprising 996 cases. *Am J Obstet Gynecol* 1976; **126**:436-41.
9. Masterton G, Napier IR, Henderson JN, Roberts JE. Three-day clotrimazole treatment in candidal vaginitis. *Br J Vener Dis* 1977; **53**:126-8.
10. Bergstein NAM, Nuyten STM. Treatment of vulvovaginal candidiasis with miconazole tampons and miconazole cream: a comparative trial. *Tydschrift voor Geneesmiddelenonderzoek*, 1980; in press.